NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		391FM05		
JUMPER HARNESS, ITEM 391 ---------- SV821755-1 (1)	3/1RAB	Electrical open, fan winding power line. Cable chafing against connector shell or shield. Improper connector strain relief, faulty connection between the connector and the lead wires, conductor severed, contact resistance.	END ITEM: Loss of continuity in one of two redundant power lines. GFE INTERFACE: Loss of one of two redundant fan power lines. Slight increase (0.05 ohms) in path resistance. MISSION: None for single failure. Terminate EVA for loss of both power lines. CREW/VEHICLE: None for single or double failure. Possible loss of crewman with loss of SOP. TIME TO EFFECT /ACTIONS: Seconds. TIME AVAILABLE: Minutes. TIME REQUIRED: Seconds. REDUNDANCY SCREENS: A-FAIL	A. Design - Open circuits are minimized by the following: Each connector/adapter ring interface is locked in place to prevent rotation by a mechanical lock. #22 Teflon insulated wires and connector provide electrical conduction and insulation properties. Connector pins are operating at 56.7% of derated temperature and wire at 70.7% of derated current. The woven Halar sheath is assembled over the internal cables to provide protection from abrasion and impact. The P3 connector backshell housing has internal edges blended smoot prevent cable chafing. Strain relief is provided by the combination of conv tubing, metal EMI braid, and 0.5" extra cable length. The braided items are secured by a band strap at each connector/cable interface. The convolute tu is threaded into the connectors. Wire crimping is performed per SVHS4909 (b on MSFC Spec-Q-1A). B. Test - Component Acceptance Test - The 391 harness is subjected to acceptance testing per AT-E-391 prior to fi acceptance to ensure there are no workmanship problems that could cause an or short circuit. Each connector/harness interface is subjected to a 9-lb. test. The insulation resistance between each conductor and the ground circ is measured during this test to ensure there are no intermittent shorts and verify the integrity of the harness strain relief. A continuity test is performed to measure the resistance of each circuit to ensure there are no circuits or high resistance paths. The insulation resistance and dielectric strength between each conductor and the shield ground is measured to ensure there are no shorts. PDA Test - An open circuit in the fan windings power lines would not be detected durin PDA testing per SEMU-60-015 para. 4.0 (Electrical Testing). because of winc power line redundancy. Certification Test - Certified for a useful life of 15 years (ref. EMU1-13-046). C. Inspection - To ensure that there are no workmanship problems which could cause an open circuit in the harness conductors, the following inspections are made: Cont crimp samples are made prior to start of crimping and at the conclusion of crimping and pull tested to ensure the crimp tooling is operating properly. crimp terminations are inspected for defects. Harness cables and conductor visually inspected prior to assembly to ensure there are no defects which c cause an open due to workmanship. Electrical bond test is performed to ver ground path through various points on the harness. In-process and final electrical checkout of the harness (conductor continuity, dielectric streng and insulation resistance tests) are performed to ensure there are no open/ circuits. D. Failure History - None. E. Ground Turnaround - None, this failure mode can not be detected during normal ground turnaround

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			B-FAIL C-PASS	testing because of the redundant design of the power line in the harness. F. Operational Use - Crew Response - PreEVA/EVA: No response, single failure undetectable by cr ground. Training - No training specifically covers this failure mode. Operational Considerations - Generic EVA Checklist, JSC-48023, procedures Section 3 (EMU Checkout) and 4 prep) verify hardware integrity and systems operational status prior to EVA Real Time Data System allows ground monitoring of EMU systems.

EXTRAVEHICULAR MOBILITY UNIT

SYSTEMS SAFETY REVIEW PANEL REVIEW

FOR THE

I-391 JUMPER POWER HARNESS

CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

Prepared by: _____
HS - Project Engineering

Approved by: _____ 5/16/02
NASA – ~~SSA~~/SSM
ES5

_____
HS - Reliability

_____ 5/21/02
NASA – EMU/SSM

_____ 4/24/02
HS - Engineering Manager

_____ 5/28/02
NASA - S & MA

_____ 5-30-02
NASA - MOD

_____ 6/04/02
NASA - Crew

_____ 6/3/02
NASA - Program Manager